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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/023,826	12/19/2001	Khosrow Lashkari	10745/29	3163

8791 7590 07/28/2005

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EXAMINER	
KNEPPER, DAVID D	

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/023,826	LASHKARI ET AL.	
	Examiner	Art Unit	
	David D. Knepper	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2002 and 30 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *(3 sheets)*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Applicant's correspondence filed on 25 Feb 2002 and 30 Sep 2004 (IDS) has been received and considered. Claims 1-25 are pending.

Title

2. The title is objected to because it is too verbose. Suggested title: "Joint Optimization of Speech Excitation and Model Parameters".

Drawings

3. The drawings are objected to because they do not show the claimed "excitation function". Correction is required.

Priority Claims

4. The applicant(s) should check their filing receipts and/or the Patent Application Information Retrieval (PAIR) system for the acknowledgment of their **domestic** priority or benefit claims (if any) under 35 USC 119(e), 120 or 121 (37 CFR 1.78).

Specification

5. The disclosure is objected to because of the following informalities:

Patent applications have not been identified by serial number on pages 3 and 15 of the specification. It is noted that incorporation by reference to the application on page 2 is made in the Background section of the application indicating that this is considered prior art.

Appropriate correction is required.

Claims

6. Claims 2, 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification on page 13 indicates that a "standard root finding algorithm" is utilized indicating that the subject matter of claims 2 and 15 is from another and is not the applicant's invention.

7. Claims 9-11, 13-15, 18 and 20-25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed equations are unclear because the variables are not defined. To further prosecution, these equations will be presumed to be standard mathematical equations that are will known in the art.

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-8, 12, 16, 17 and 19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kroon (5,664,055).

As claimed, Kroon teaches "digitally encoding speech". He utilizes an "excitation function comprising a number of non-zero pulses separated by spaces therebetween; and computing a synthesized speech in response to said non-zero pulses and non computing a contribution of said spaces" as shown in figure 1 in combination with his improvements. It is significant to note that Kroon teaches any number of details upon which claims 1-8, 12, 16, 17 and 19 read. Figure 1 shows pulses upon which computations must be made in combination with spaces which do not require any computations and is used by Kroon as background showing how earlier systems (fig. 2) used a simpler pattern of excitation pulses which merely repeated. Kroon

Claims 2: The use of a "synthesis filter polynomial using an iterative root optimization algorithm" is taught with his polynomials shown in col. 13-14. Kroon shows additional detail by indicating that line spectral frequencies may be used because they have known polynomial representations which are easily solved in such a way that the mathematical relationships between conjugate pairs may be exploited in order to solve them using known recursive ("iterative") techniques.

Claim 3: See his fig. 1. Uniform spacing of excitation would be a regular pulse excitation. Since Kroon teaches adaptive excitation further improved with fractional calculations, non-uniform spacing will occur.

Claim 4: Uniformed spacing is shown in figure 2, labeled as prior art.

Claim 5: See figure 1, to LPC Synthesis filter.

Claim 6-8: figure 1 shows more than one pulse which is therefore multipulse and spaces

do not include pulses (unlike spaces in the prior art, fig. 2 that do include a pulse).

Claim 12: Convolution is the mathematical process by which a computer applies excitation to LPC parameters in the synthesis filter to generate speech.

Claims 16, 17, 19: computing a synthesis polynomial is shown by Kroon in col. 13, lines 37-col. 14 where he explicitly teaches using the well known mathematical relationships with polynomials and root solutions techniques in a Linear Prediction synthesizer.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 9-11, 13-15, 18 and 20-25 are rejected under 35 U.S.C. § 103 as being unpatentable over Kroon (5,664,055) in view of Chen ("A New algorithm for Parameter Re-optimization in Multi-Pulse Excitation LP Synthesizer).

It is noted that Kroon does not explicitly teach the particular equations claimed. However, he teaches that it is well known to use polynomial (col. 13) root solutions in combination with multiplulse (his one or more main pulses) with Linear Prediction speech coding sytems (col. 1, lines 55-64). Chen teaches that it is well known to optimize the both the

excitation and the LPC parameters using the identities on page 561 – see his teaching that it is well known to re-optimize the synthesis filter parameters and pulse amplitudes in the Mullti-Pulse Excitation Linear Prediction Synthesizer (abstract). It would have been obvious for a person having ordinary skill in the pertinent art, at the time the invention was made, to combine the optimization of Chen with the LPC of Kroon because Chen teaches that it will improve the quality of the synthesized speech greatly (see abstract and page 563).

Thus, the simplified equations claimed would have further been obvious because the use of a partial derivative (i.e. – claims 11, 20 and 25) for polynomial solutions taught by Chen on page 561 teach that the solution may be derived with the A term only. Thus, the simplified form of convolution such as claimed by the applicant in claims 9, 10, 13, 18, 21 and 22 are obvious mathematical manipulations. Alternativley, the simplified convolution would be obvious if the error is presumed to be very low or equal to zero.

Claims 23 and 24 are rejected under similar arguments as applied to claims 3-5 as noted above.

Prior Art

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Adoul (5,699,482 and 5,754,976), Mittal (6,662,154), Kroon (5,732,389) and Ca (US 2003/0014263 A1) are cited to show that it is well known to that the properties of sparse codes where there are relatively few non-zero components will speed up calculations significantly.

Reiglesberger et al. (Glottal Souce Estimation...) is cited to show that it is well known to apply Gradient Descent Techniques to speech processing.

Lashkari (Optimations of the CELP Model in the LSP Domain) is cited to show what is apparently the instant application with some additional mathematical background. Namely, that gradient descent algorithm is preferred over some generic gradient analysis and in this article it is clearly indicated that minimization is performed in the LSP domain.

13. Some correspondence may be submitted electronically. See the Office's Internet Web site http://www.uspto.gov for additional information.

Please address mail to be delivered by the United States Postal Service (USPS) as follows:

Mail Stop _____
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Fax phone number for Group 2600 is (703) 872-9306

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Knepper whose telephone number is (571) 272-7607. The examiner can normally be reached on Monday-Thursday from 07:30 a.m.-6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (571) 272-7602.

For the Group 2600 receptionist or customer service call (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions

relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by email at ebc@uspto.gov. For general information about the PAIR system, see http://pair-direct.uspto.gov .

David D. Knepper
Primary Examiner
Art Unit 2654
July 25, 2005